

DIGITAL DESIGN LAB

Introduction

This Lab covers the topics on

- Combinational and sequential logic circuits
- Programmable logic devices
- State table and state diagrams
- Arithmetic operations and algorithms
- Algorithmic state machines
- RTL level realization of digital systems
- FPGA digital IC's hardware kit Implementation

Scope of the Lab

- The objective of the lab is to impart knowledge of the basic tools for the design of digital circuits and to provide methods and procedures suitable for a variety of digital design applications.
- Laboratory exercises on combinational and sequential logic circuits using digital ICs and FPGAs will be covered in labs.

Courses to cater

Course Title : Digital Design (CS/EEE/ECE/INSTR F215)

- BE(H) Computer Science
- BE (H) Electrical and Electronics
- BE (H) Electronics and Communication
- BE (H) Electronics and Instrumentation

Equipment Setup

Universal Digital Lab Trainer Kit



FPGA Development Board



Analog Discovery



Digital IC Tester



List of experiments

- Implementation of Boolean functions using logic gates
- Adders and subtractors
- BCD Adder
- Decoders, multiplexers and demultiplexers
- Comparators and Arithmetic logic unit
- Latches and flip-flops
- counters
- Shift Registers
- Gate level modelling in verilog and FPGA kit implementation
- Verilog : Instantiation and testbench
- Data-flow modelling in Verilog and FPGA kit implementation
- Behavioral modelling in verilog and FPGA kit implementation

Application Areas

- Communication
- Image Processing
- Control Engineering
- Cryptography
- Fuzzy Logic
- Robotics
- Prototyping

Lab Technician

- Mrs. B. Krishnaveni
- Mr. Khadar Bhasha

Software

Xilinx ISE

Hardware

- Universal digital lab trainer PHY-1002 kit
- FPGA kit
- Digital IC tester
- Analog discovery kit
- PHY-451 universal digital lab trainer kit

